The Excavating Engineer

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Replacing Old Pavements in Milwaukee, Wisconsin

White Construction Company's Use of a Small Revolving Shovel for Ripping Up Old Pavements of the "Permanent" Type

IN 1907 the White Construction Company was organized in the city of Milwaukee. Today, eighteen years since its founding, the organization is known throughout the Central States, has its head office in Chicago and maintains other offices in Milwaukee, Wisconsin, Madisonville, Kentucky, and Pontiac, Michigan. During the eighteen years of its activity the company has specialized on grading and paving, sewage disposal, bridges and railroads. Its experience has been wide, and their organization is a highly efficient one.

This organization has tried out many methods of both removing the bitulithic surface of a paved street preparatory to resurfacing and removing the entire pavement (both surface and base) where the base is to be replaced. Ten years ago the work was mainly that of resurfacing, and the old surface was broken with plows drawn by teams. Some very fast work was done by this method, but about the year 1917 motor trucks replaced the horses for pulling the plows. This method again increased the speed of the work. Some three years later the company had considerable work, involving the removal of both base and surface. At that time they used the following method. A steam shovel picked up a heavy iron ball attached to a dipper tooth and raised it as high as the dipper would reach; a trigger then released the ball, allowing it to drop on the pavement. The ball weighed about 700 to 800 pounds, and broke up the pavement so that it could be handled by the shovel. After 500 to 600 square yards of pavement was broken in this manner, the shovel would load the broken material.

This method, now, has given way to that described below. The shovel, unaided, breaks up and loads pavements consisting of a 6-inch concrete base and 3-inch asphalt surface.

Last summer this company obtained contracts for ripping up old pavement and repaving a number of streets in Milwaukee. For the purpose of breaking up and loading the old "permanent" pavements, the company purchased a Bucyrus 20-B steam-driven shovel, mounted on caterpillars and equipped with a 20½-foot boom and a ¾-yard dipper. This machine was delivered early in August.

A 10,000-Square-Yard Job of 9-10-Inch "Permanent" Paving

The first job on which the shovel was used was that of ripping up about 10,000 square yards of paving on Jackson Street, Milwaukee, between Oneida Street and Ogden Avenue, a distance of about half a mile. On this part of Jackson Street there are two street car tracks (for north and south-bound cars) which broke the stretch of paving to be removed into two strips, each 16 feet 6 inches wide. The paving consisted of three to five inches of asphalt on six inches of concrete; curbing was not disturbed. The work was continually interrupted by the constant passing of street cars; in fact, it was necessary to stop and wait (clearing the track of fragments when necessary) every 1½ to 2 minutes. In spite of this, the ¾-yard shovel broke up and loaded from seven to eight hundred square yards per day, working one shift of eight hours.

Before this job was finished another rather unusual feature was added. The City of Milwaukee wanted to use the concrete for a fill on a bridge approach and did not want the asphalt mixed with it. It was necessary, therefore, to make two trips over the work. On the first cut the asphalt alone was torn up and hauled two and a half miles to a dump on the lake shore. On the second cut the concrete base was loaded and hauled to the bridge approach a mile away. Three 5-ton Mack trucks, two owned by Marchese Bros. and one by A. Reis, served the shovel. In spite of having to make two cuts, the contractors kept their yardage up to a satisfactory amount. The grading was finished in two weeks, and the entire contract (grading and placing concrete base) four days ahead of the one month allowed by the contract.

UMI

Illustrating the Manner in Which the Broken Asphalt and Concrete Loads Into the Dipper

Taking a cut directly toward the curbing — note that several of the larger pieces have toppled over the curbing and on to the grass. These are thrown back into the cut by the pit man, or raked back with the dipper and loaded with the next dipper full.

Dipper of Small Revolving Shovel at the Beginning of Cycle

Ripping up the pavement at the intersection of Frederick Avenue and Newberry Boulevard. Note that the curbing has been removed from the corner in the background. These small sections of curb and gutter were poured from a one-sack mixer.

Bucyrus ¾-yard Shovel Breaking Up and Loading the Pavement

Views on the White Construction Company's Grading Work on Newberry Boulevard, Milwaukee

1,000 Square Yards a Day of 9-Inch Paving

The ¾-yard shovel was next put to work removing a strip of pavement on Newberry Boulevard between Oakland and Downer Avenues, a distance of half a mile. This thoroughfare consists of two paved roads separated by an esplanade; each paved portion is about 37 feet wide. The pavement to be removed was laid twenty-five years ago by the Barber Asphalt Company, and consisted of six inches of concrete overlaid with three inches of asphalt. The White Construction Company's contract called for the removal of 23,000 square yards of pavement (both base and surface) and the repaving of the street. Here again the old pavement was torn up and loaded by the shovel without any previous preparation. However, on this job the machine was not interrupted by frequently passing street cars, and the average output was 1,000 square yards a day, one eight-hour shift. The shovel was served by four 5-ton Mack trucks owned by Marchese Bros. of Milwaukee; the material was hauled two miles to a dump on the lake shore. The time allowed for this job (both grading and laying of concrete base) was six weeks; this was beaten by seven days.

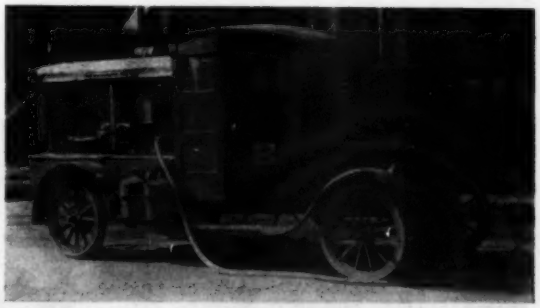
The Paving Operations

As mentioned above, the White Construction Company's contract included the paving on each of these jobs. For this work they used the batch method. Mack trucks, each holding four batches of one cubic yard of material, brought the dry aggregate to the skip of the Koehring paver. The curb and gutter were poured from a small one-sack mixer, as it was only necessary to lay short stretches.

Joe Carbone, Foreman in Charge of Grading in Milwaukee, for the White Construction Co.

Work on Martin Street

The White Construction Company's next job of this sort was one involving about 2,000 cubic yards of grading on Martin Street. This street leads to the eastern approach of the new Martin Street-State Street Bridge, and its repaving was included in the city's plans to make the bridge one of the main arteries in Milwaukee for east and west-bound traffic. The grading included the removal of three inches of asphalt, an eight-inch base course of concrete, and old ties and ballast to a further depth of 4 inches. On this work, five 5-ton Mack trucks, owned by Marchese Bros., served the shovel. The material was hauled to a point about a mile away, where it was used to fill for a future lake front park. Traffic conditions prevented continuous work.



A Chicago-Pneumatic compressor mounted on a Ford truck. This unit is supplying air to the hammer shown below.

Other Work Laid Out for the Machine

Among other contracts which the White Construction Company has in Milwaukee, for work on which the small revolving shovel will be used to break up pavement are the following:

4,200 square yards of old concrete pavement to be removed from 27th Street between Vliet and Lisbon Avenue, a distance of about one-third of a mile; 4,000 square yards of asphalt and concrete to be ripped up on Marietta Avenue between Kenwood Boulevard and Folsom Place — this strip is 1400 feet long and about 30 feet wide; about 8,000 square yards of asphalt and concrete to be removed from National Avenue between 27th and 29th Avenues — two strips, each 20 feet wide and 600 feet long.

As this article is written, the shovel is working on the 27th Street job, and since the old concrete without the asphalt surface is wanted for filling purposes the two courses are being removed separately. The machine has just completed ripping up and loading 4,200 square yards of three-inch as-

Using a concrete buster to break up the heavy concrete walls of one of the Electric Company's underground junction boxes which was above grade and had to be rebuilt.

Views on the White Construction Company's Grading Work on Newberry Boulevard, Milwaukee

phalt in three days of eight working hours each.

The White Construction Company is firmly convinced that using a shovel of this type is the only effective way to remove large areas of old pavements of the "permanent" type, where there is room to operate the shovel. A shovel of smaller power, which requires special preparation of the pavement before handling, will increase the cost of the job from three to four fold.

Billy Biggs is pulling the levers on the machine, while Basil Davis keeps up steam. Joe Carbone is foreman on the job. Mr. E. J. Hornbach is superintendent; his office is in the Trust Company Building, Milwaukee.

The Ghostly Crew of the Princess Pat

By Arnold Andrews

It was New Year's day at the Princess Pat,
But the high moguls didn't care for that;
They said, "We'll strip, just can't stop now,"
And then went out for a grand pow wow.
So the day crew dug though they sure were sore
That they had to stick on the nineteen four.

Night shift was tight and stayed away,
So they dug that night and they dug next day;
And it wasn't until the day after that
That the gang showed up at the Princess Pat —
Though they heard the shovel puff and roar
They couldn't see a soul on the nineteen four.

They searched for the fireman everywhere,
Yet they could not see a hide nor hair,
But they found his shoes by the shaker bar
And his overalls by the coaling car;
And that was all that they could find
Though they looked before and they looked behind.

The coal bin was empty and swept up clean,
Not a pound of coal on the darn machine,
But the scoop shovel scraped on the empty floor
And flung itself at the firebox door,
Where the white flames leaped and roared in glee
While the pop off screeched like a wild banshee.

They looked for Johnny, the Texico kid,
For they thought that maybe he might have hid,
They hollered and hunted but all they caught
Was a big grease spot by the tallow pot;
Yet the engine ran without a squeak
And the cable slid like a big black streak.

The whistle tooted its "Move me quick"
While jacks came loose gosh awful slick,
But all you could see was a red mustache
And ties going by like a lightning flash;
The rails and bridles just simply flew,
But how they did it nobody knew.

In the runner's shack on the right-hand side
An empty glove pulled the throttle wide;
There was nothing else but an old cob pipe
That was puffing smoke and a-smelling ripe,
But the dog-gone levers shifted to and fro
And that old Bucyrus sure did go.

Not a sign of the craner in the left-hand pen.
Just a pinch of snuff where he should have been
A rolling and a turning and a spitting juice —
Lots of empty boxes but no more snuce;
But the dipper bit in the big dirt bank
And the latch was tripped at the cable's yank.

Well that gosh blame shovel ran about a week
A casting dirt in a nice high peak
All around the borders of the Princess Pat
And across the line and they couldn't have that;
They tried to stop her as best they knew
But she kept right on with her ghostly crew.

So they bedded her down with some dynamite.
And stuck in a cap with the fuse alight;
The shot went off with an awful roar
But that didn't stop the nineteen four,
And the last they saw, or so they tell,
She was going toward heaven and digging like hell.

A Two-Mile Highway Tunnel Through the Rockies

An Old Railroad Tunnel Is Rehabilitated for Automobile Use and Is Also Made to Carry Water for an Irrigation Project in Colorado — How a ¾-Yard Shovel Was Moved Through the Tunnel

BETWEEN Leadville, Colorado, and Glenwood Springs is the height-of-land which separates the Arkansas River Valley from that of the Colorado River. Many years ago, the Colorado Midland Railroad, built a two-mile tunnel through this range. This tunnel, known as the Busk-Ivanhoe Tunnel, connects the eastern and western slopes with a bore which averages from 13 feet 8 inches to 19 feet wide, and which descends toward the east on a 1.44 per cent grade.

Several years ago the railroad was abandoned, and the rails and ties torn up from the roadbed. During these dismantling operations, A. E. Carleton of Colorado Springs, who had acquired a controlling interest in the road, made certain that the right-of-way was left in such shape that it could readily be turned into an automobile road. During the latter part of last year Mr. Carleton presented this tunnel, together with the old railroad's right-of-way, bridges, etc., to the State for use as an automobile road.

The shovel after all dismantling necessary, except the removal of the hoist drum and large gear, had been completed. Note the boiler on a wagon to the left.

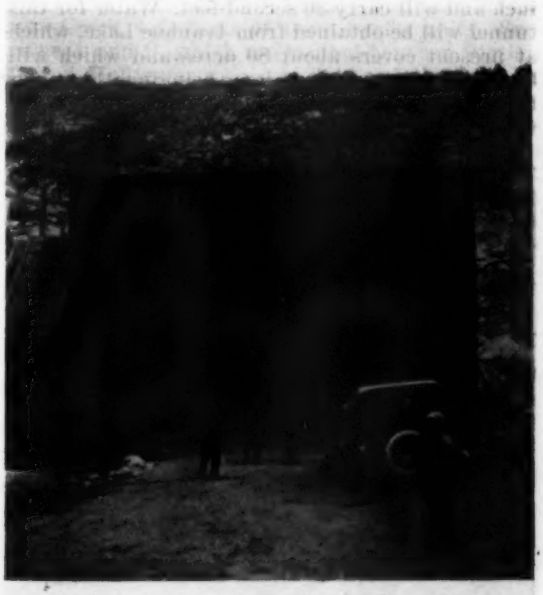
The Characteristics of the Road

The road gives a 4 per cent grade on the eastern slope leading up from Malta to the eastern portal of the tunnel, which is about a 30-minute drive out of Leadville on the old right-of-way.

Leaving the western portal the road goes down through a steep canyon, formerly known as "Hell Gate," and meets the Frying Pan River at Norrie. Just below "Hell Gate" it will be necessary to build a detour 3,000 feet in length, in order to avoid the expense of retimbering a short tunnel.

The tunnel connects with Basalt on the western slope of Mt. Massive, and also gives access to the famous fishing grounds of the Frying Pan country and to Thomasville and other resorts.

From Thomasville down to Carbondale the old Midland roadbed is utilized. Over this new route the distance between Leadville and Glenwood Springs is 81 miles, while by the former route, through the Tennessee Pass, the distance was 93 miles, a net saving of twelve miles.



The Eastern Portal of the Two-Mile Tunnel on the New Leadville-Glenwood Springs Highway in Colorado

There is a natural draft through the tunnel at all times, so that at the present time no artificial ventilation is planned. Furthermore, the tunnel is absolutely straight except for about 50 feet at the western end, which assists very greatly in keeping cars from meeting in the middle of the tunnel. To further simplify the handling of traffic a schedule has been worked out which calls for cars to enter at the east portal from the even hour to twenty minutes after the hour. Cars from the west portal may enter from the half hour to ten minutes of the hour. It is expected that clocks with suitable signs will be installed at both ends to give instructions to drivers.

The Irrigation Project

Combined with rehabilitating this old railroad tunnel for highway use, there is being developed

one of the largest irrigation projects launched in Colorado during the last ten years. This irrigation scheme is being carried out to increase the water supply on the eastern slope of the range. All the water on the eastern slope has already been filed upon, and it is impossible to get water for irrigation purposes on this side of the mountain. On the western slope, however, there is an abundance of water, and the Carleton interests, by means of a flume through the highway tunnel, will bring to the eastern slope enough water to irrigate 20,000 acres of land in the Arkansas Valley. The flume will be three feet in diameter, will have a maximum pressure of 20 pounds per square inch and will carry 80 second feet. Water for this tunnel will be obtained from Ivanhoe Lake, which at present covers about 80 acres and which will be raised 10 feet by a dam, bringing the water level high enough to create a flow through the tunnel by gravity. To further increase the supply

The ¾-yard revolving shovel knocked down, ready to be moved through the tunnel. The men in the picture include John Alger, the mechanics on the job, and the drivers of the three trucks which did the towing.

of water to be taken from the western to the eastern slope, it is planned to dig a ditch from a nearby creek which will bring the water from another small lake, Lake Lisle, to join that of Ivanhoe.

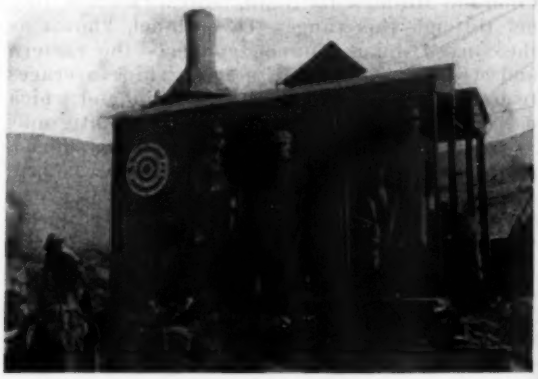
A Watershed of 25,000 Acres

On the western slope in the snow shed above the tunnel are 25,000 acres, and since the water from an acre of snow will irrigate an acre of land, and since there is reservoir space which can be developed to hold all the water needed, the irrigation development is considered of prime importance for the future growth of the farming industry in this section of the Arkansas Valley.

Small Revolving Shovel Used to Dig Ditch to Increase Area of Watershed

The raising of Ivanhoe Lake submerged a section of the former railroad and made it necessary to construct a new stretch of road a mile long around the lake.

To be used in building this road, and to dig the ditch which will make Lake Lisle a feeder for Lake Ivanhoe, a Bucyrus 20-B ¾-yard, full-re-



Safely through the tunnel and operating on the western slope. John Alger, operator and a member of the firm is by the operator's seat; his fireman, J. J. McNeill, is standing by the boiler.

volving shovel mounted on caterpillars was purchased by the firm of Dukelow & Alger. This shovel was delivered by the railroad at Malta, and was erected at that point by John Alger and his fireman, J. J. McNeill. The shovel moved out from Malta under its own power, a distance of twelve miles to the eastern portal of the tunnel.

Shovel Dismantled for Trip Through Tunnel

In replacing the weakened timbers of the tunnel, and in building the new roadbed, the old railroad clearance was lost, and the new clearance was only sufficient for automobiles and trucks. Hence the shovel was dismantled at the mouth of the tunnel, and the house, boom and dipper sticks taken off and hauled through separately. The boiler was also removed and hauled through on a wagon. It was then found by careful checking that the large gear on the main drum shaft would fail to clear some of the timbers by just two inches, and it was, therefore, necessary to remove the hoist drum shaft. The shovel started into the tunnel one Sunday afternoon at about one o'clock. Three trucks were used to supply the motive power, two Nash quads and one White. It took eight hours and a half for the shovel to make its journey.

Snowed In

The firm of Dukelow & Alger were making good progress on the contract for the main ditch and had about two weeks work left to do when a

heavy fall of snow forced them to close down the job and leave operations suspended until next spring and the shovel snowed in for the winter.

Air Jackhammers Operated by Steam from Shovel Boiler

There is one detail of the excavation operations which is unusual. Quite a little rock had to be blasted in digging the main ditch. The drilling was accomplished by means of regular air jackhammers, using steam from the shovel boiler instead of air. The jackhammers drilled on an average of about 50 feet of holes per day, and in many instances the shovel was operated while the drilling was in progress. The connection for the steam line to the drills was brought down through the center part so that it did not interfere with the shovel's operation.

Building Another Link of the Dixie Bee-Line Highway

Small Revolving Shovel Work in Alabama on New Highway to Connect Montgomery and Birmingham

UNDER the capable management of the Newell Contracting Company, Birmingham, another link of the Birmingham-Montgomery section of the Dixie Bee-Line Highway is being carried to completion in Autauga County, Alabama. This is probably the most important road in Alabama, as it connects the capital, Montgomery, with the largest and most important manufacturing city, Birmingham, the steel center of the South.

Group in Camp: Extreme Left, Mr. Will Newell; Left Center, Carl Williams, Foreman; Extreme Right, Neal Newell

The work in question is known as Section C, Federal Aid Project No. 148, beginning about six miles north of Prattville in Autauga County, and extending to the Chilton County line near Mountain Creek, a distance of about twelve miles. Sections A and B, which are located between Section C and Montgomery, are being handled by D. R. Cook of Selma.

W. J. McMichael, Shovel Engineer, Julius Barnes, Fireman

In rebuilding this link a new location was followed, the maximum curvature being 6 degrees and maximum grade 5 per cent. At the present time only the grading is being done, in order to allow the fills to settle before a permanent hard surface is applied. The standard roadway is 18 feet wide in cuts, with 6-foot ditches on each side. On the fills the width is 26 feet. In order to make the curves safer on fills they are widened to 29 feet.

Bucyrus 20-B ¾-yard shovel starting a hillside cut. Note that three mules are used to each wagon.

Grading Operations

The amount of grading involved in Section C is 160,000 yards of common excavation, about half of which is located in several miles on the northern end of the project. To handle this work, Newell Contracting Company has installed their Bucyrus 20-B ¾-yard shovel with 1½-yard dump wagons. The lighter cuts are being done with wheelers.

Typical Section of Graded Roadway on Section C of the Dixie Bee-Line Highway

Forming a fill on Newell Contracting Company's contract. The short haul from cut to fill makes it possible to serve the shovel (left background) with six 1½-yard wagons.

Looking Back Toward the Work, over a Section of the Right-of-way Ahead of the Shovel

On account of the irregular topography of the country, the cuts and fills are short and close together. Under these conditions it has been found that six 1½-yard wagons, with three mules to the wagon, are ample to serve the shovel.

Coal is being supplied from the town of Wadsworth, 3 miles distant.

In cutting ditch lines and dressing up the grade the contractors are using two Monarch tractors, one 5-ton and one 7-ton, pulling Stockland graders.

Work was started on May 10th, and grading was finished in September.

This work is being handled by Messrs. Neal and Will Newell of the Newell Contracting Company, and the rapid and thorough manner in which it is being pushed to completion is in line with their long and successful experience in highway construction.

W. J. McMichael is piloting the 20-B, assisted by Julius Owens at the boiler. Carl Williams is foreman.

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Growth of the Gasoline Tax

It is interesting to note the rapid growth of the gasoline tax for motor vehicles throughout the United States.

The general disposition on the part of the state legislatures seems to be not only to extend this method of taxation but to increase it. It is fast winning the approval of the motorist on account of its simplicity and its eminent fairness.

According to the most recent available figures only four of the 48 states are without such a tax, and some of these have the matter under consideration. These states are Illinois, Massachusetts, New Jersey and New York.

The tax varies from 1 to 4 cents. Arkansas and North Carolina have a 4-cent tax.

The amount collected from the motorists in the year 1924 was nearly $80,000,000. Of this, about $49,000,000 was made available for road construction and maintenance under the supervision of the state highway departments, and a large share of the remainder turned over to county and local road funds.

The amount paid annually by the average motorist where the tax is collected is $10.30 per vehicle.

Highway Excavation for 1926

THROUGH the courtesy of the State Highway Departments throughout the United States and the Highway Commissioners of the Provinces of Canada, *The Excavating Engineer* presents a brief outline of the Highway work contemplated during the coming year in the several states listed below. Unfortunately, the plans of many of the states have not been formulated as yet; the data for these states, as well as for those states, for which the information is received too late to be included in this number, will be included in later issues.

These figures include Federal Aid, State and County work, but do not include road construction by cities and towns. It is probable that the need for further excavation will develop as the work gets under way — excavation which has not been included in the estimates supplied us by the highway departments.

Our figures do not show just what percentage of the contemplated work is hard surfaced and what is gravel surfaced, but if we assume that 40 per cent of the work listed below is to be gravel surfaced, it is probable that the figures given for total excavation are low, and should be increased by the amount of gravel pit excavation not included. Experience has shown that this last figure, together with borrow pit work, not included, will very materially increase the figure for estimated shovel excavation.

In 1923 the total amount spent for roads, Federal Aid, State and County, amounted to about $990,000,000; in 1924 this figure was about the same and in 1925 it is estimated to have been over $1,000,000,000. To say that over a billion dollars was invested in state highways during the year 1925 does not convey a great deal to the average individual, but it means an investment of about ten dollars for every man, woman and child in the United States.

Colorado

Budget not made out in time for publication in this issue.

Connecticut

Information not available.

Delaware

Approximately 60 miles of Federal Aid, State and County highways have been projected at a cost of approximately $2,000,000. It is estimated that this will involve about 210,000 cubic yards of excavation and about 30 per cent or 63,000 cubic yards of this will be suitable for steam shovel work. 15 miles of 1925 projects remain to be completed in 1926; all of this is under contract.

Florida

The Federal Aid and State Highway construction program calls for approximately 300 miles of new highways at an approximate cost of $8,000,000. Excavation involved will amount to only about 10,000 cubic yards.

Georgia

The road construction program will amount to about 400 miles of new highways at a cost of approximately

$7,000,000. This will involve about 1,000,000 cubic yards of excavation. The proportion of steam shovel work required has not been determined, but it is estimated that it will not exceed one-eighth of the total. The 1925 road project that remains to be completed in 1926 amounts to approximately $1,200,000.

Idaho

113 miles of Federal Aid highways are contemplated. Plans are being prepared and it is expected that this work will be under contract before the 1926 construction season opens. The estimated cost of this construction is $1,622,000, About 490,000 cubic yards of material will be excavated, and of this about 100,000 cubic yards will be suitable for steam shovel work. 1925 work that remains to be completed this year amounts to 14.5 miles and will cost $430,000. This will involve about 100,000 cubic yards of excavation and of this yardage 40,000 cubic yards will be suitable for steam shovel work.

Illinois

Report not available until too late for publication in this issue.

Iowa

A three-year construction program is being completed at this time. This will be largely grading and graveling, with very little paving. About $28,000 will be expended on this project.

It is expected that during this year approximately 570 miles of earth roads will be constructed; this includes 50 miles of work started in 1925. Of this amount about 80 miles is now under contract, but no work has been done. 50 miles have been well started and 440 miles are still to be let. The yardage involved in this project will perhaps be between seven and eight million cubic yards. About 90 or 95 per cent of this will be done with elevating graders and draglines, and the balance will require steam shovel work.

Kansas

Definite program is not available but it is estimated that about 1,000 miles of new roads will be projected. The amount of excavation has not been decided.

Kentucky

No information is available at this time as the 1926 program will not be decided until after July 1st. However, all projects authorized in 1925 will be carried on during 1926. The cost of this work is estimated at about $3,500,000. 1,600,000 cubic yards of excavation is involved on this project. No estimates are available on the amount of steam shovel work required.

Louisiana

$9,000,000 will be expended on about 700 miles of new highway construction. Approximately 10,000,000 cubic yards of excavation will be involved on this project. About 3,500,000 cubic yards of this excavation will be suitable for dragline, floating dredge and other excavation machinery work. Approximately 600 miles of work projected in 1925 will be carried over into 1926; all of this has been contracted for.

Maine

250 miles of Federal Aid, State and County roads are to be constructed at a cost of approximately $3,000,000. About 150,000 cubic yards of material will be excavated. The amount of this work suitable for steam shovel work has not been determined. There will also be an expenditure of $650,000 for reconstruction, which will involve about 50,000 cubic yards of excavation. It is probable that most of this will be done with steam shovels. The amount of work authorized last year which will carry into 1926 amounts to about $1,750,000, all of this is let and practically completed.

Maryland

140 miles of new roads are to be constructed. The expenditure is not available at this time. Approximately 600,000 cubic yards of excavation will be necessary. Of this yardage 300,000 cubic yards will be suitable for steam shovel work. All of 1925 funds are under contract and 90 per cent completed.

Massachusetts

Appropriations for 1926 will not be made by the Legislature until April. However, it is estimated that the program will be similar to that of last year, calling for about 250 miles of new highways at an approximate cost of $10,000,000. This will involve about 900,000 cubic yards of excavation, and possibly 65 per cent of this will be suitable for handling by steam shovels. 15 miles of work projected in 1925 remains to be completed this year. 3.2 miles of this has not as yet been contracted for.

Michigan

Information not available at this time.

Minnesota

1926 construction program will not be laid out before March 1st.

Missouri

1500 miles of new roads have been projected. 1,000 miles will be hard surfaced, and 500 miles will be constructed of gravel and earth. The appropriation for this work amounts to $25,000,000. It is estimated that approximately 5,000,000 cubic yards of excavation will be involved, and about 5 per cent of this will be suitable for steam shovel work. The 1925 work that remains to be completed in 1926 consists of 600 miles of surfacing and 200 miles of grading.

Montana

The only data available involves 125 miles of Federal Aid construction. An average of 7000 cubic yards per mile of excavation is estimated on this project. One of the lettings will involve about 15 miles of excavation which will be suitable for steam shovel work. The cost of road construction started during 1925 that remains to be completed in 1926 amounts to about $700,000, all of which has been contracted for.

Nebraska

Definite information will not be available before February, but it is estimated, however, that approximately $4,000,000 will be expended for construction on 800 miles of gravel, 100 miles of grading and 20 miles of paved highways. This will involve possibly 1,500,000 cubic yards of excavation, and about 5 per cent of this will be suitable for steam shovel work. Approximately $2,000,000 will be used for maintenance and reconstruction of highways. About $500,000 of work authorized in 1925 remains to be completed in 1926. Very little of this will require excavation.

Nevada

No data available until the latter part of January.

New Hampshire

Program will not be formed until some time in February.

New Jersey

No information available.

New York

No definite data can be furnished until program is arranged next March.

North Carolina

Federal Aid and State highway construction will amount to approximately 200 miles of hard surfacing, and about 500 miles of soil roads at a cost of about $12,000,000. The amount of excavation necessary on this project is not available. Work started in 1925 that remains to be completed this coming season amounts to approximately 445 miles of hard surfacing and 335 miles of topsoil and grading. All of this has been contracted for during 1925.

Ohio

Budget has not yet been made up.

Oklahoma

Approximately $10,000,000 will be spent on Federal Aid and State highway construction. It is estimated that about 2,500,000 cubic yards of excavation will be involved, very little of this will be done with steam shovels. Work projected in 1925 that remains to be completed amounts to approximately $1,500,000. All of this has been contracted and will be continued during 1926.

Oregon

1926 construction program not yet decided upon. Work authorized in 1925 that remains to be completed this season amounts to 72 miles of grading, which will cost about $1,750,000, all of this is under contract. The work will involve approximately 2,500,000 cubic yards of excavation. It is estimated that about 50 per cent of this will be suitable for steam shovel work.

Pennsylvania

875 miles of Federal Aid, State and County construction has been projected. The cost of this work will amount to about $43,000,000. Approximately 4,000,000 cubic yards of excavation will be involved in this project and about 95 per cent of this yardage will be handled by steam shovels. $1,400,000 will be expended for reconstruction. About 50 per cent of this work will be suitable for steam shovels.

Rhode Island

In addition to the 30 miles of Federal Aid construction projected during 1925 that remains to be completed, about 40 miles of new roads will be constructed during 1926. The cost of this work is estimated at $1,500,000. This will involve approximately 120,000 cubic yards of excavation, of which 95 per cent will be suitable for steam shovel work.

South Carolina

The program calls for 600 miles of new highways to cost approximately $5,500,000. 4,000,000 cubic yards of excavation is estimated, of which 5 per cent will be suitable for steam shovel work. $1,200,000 of work projected in 1925 remains to be completed this year. All of this has been contracted for.

South Dakota

A program calling for 600 miles of State highways that will cost $1,900,000, together with 1500 miles of county roads on which $3,500,000 will be expended, has been formed. The excavation on this project will involve about 11,000,000 cubic yards of excavation. Of this yardage 20,000 cubic yards will be suitable for steam shovel work. 50 miles of reconstruction work, involving about 20,000 cubic yards of excavation, is also included in the 1926 budget. Approximately 45 miles of road work projected in 1925 remains to be completed this coming season.

Tennessee

Construction program not determined upon at this time.

Texas

Approximately 1500 miles of new construction to cost about $12,000,000 has been projected. This will involve about 12,000,000 cubic yards of excavation. About 2 per cent of this will be suitable for steam shovel work.

Utah

Federal Aid work consisting of 117.24 miles of new gravel surface roads and 60.23 miles of holdover is now under construction. Approximately 850,000 cubic yards of excavation is involved in this project, and about 150,000 cubic yards of this will be suitable for steam shovel work.

Vermont

As the construction program has not been laid out an unofficial estimate is given which calls for about 17 miles of new roads at an approximate cost of $680,000. About 125,000 cubic yards of excavation will be involved in this project. Of this yardage 80 per cent will be suitable for steam shovel work. Work started in 1925 that remains to be completed during 1926 amounts to approximately 12½ miles.

Virginia

$7,060,000 has been appropriated for 1926 construction. This appropriation consists of convict labor, two-thirds gasoline tax, Federal Aid, state mill tax, supervision and special appropriation by the Legislature.

Washington

Information not available at this time.

West Virginia

$12,000,000 will be expended on about 450 miles of Federal Aid, State and County highways. Approximately 2,900,000 cubic yards of excavation will be necessary on this construction. About 2,500,000 cubic yards of this will be suitable for steam shovel work. Road construction projected in 1925 that remains to be completed in 1926 amounts to about 221 miles of grading and 226 miles of paving, all of this has been contracted.

Wisconsin

Program not made out in time for publication.

Alberta

Budget will not be made out by the Legislature until late in January or February; until then no program is available.

Halifax

Program not made up until February.

Ontario

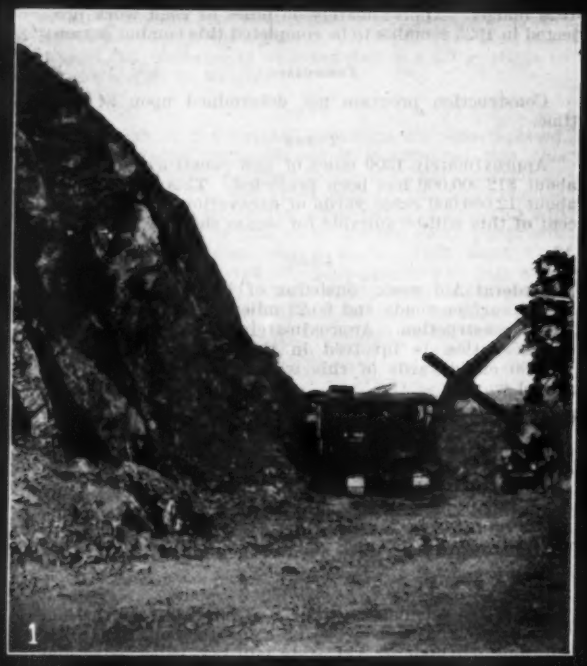
No statement can be made as the program was not prepared in time for publication.

Quebec

The program for 1926 is now being acted upon and will not be completed before February.

Saskatchewan

As the Legislature does not assemble until after the new year, it is not possible to obtain any information regarding highway construction in time for this issue.



DIESEL SHOVEL OPERATION ON THE JOHN DAY HIGHWAY IN OREGON

K. L. Goulter & Company's ¾-yard Shovel in Some Heavy Digging on the Unity Section

1. Near the end of a cut involving removal of 10,000 cubic yards of solid rock.
2. Beginning a 21,000-cubic-yard thorough cut. Note the way the motor trucks run forward to the shovel and back away to the fill when loaded.
3. A "close-up" of the shovel at work, Bucyrus 20-B, caterpillar mounted.
4. Looking from the top of the bank. The 21,000-cubic-yard cut about one-third complete. Note that the trucks are still backing away from the shovel to the fill, and thus do not need to be turned. Three White trucks are used to serve the shovel.
5. The 21,000-cubic-yard cut completed in twenty-five days. The shovel worked two 8-hour shifts per day.

UMI

4

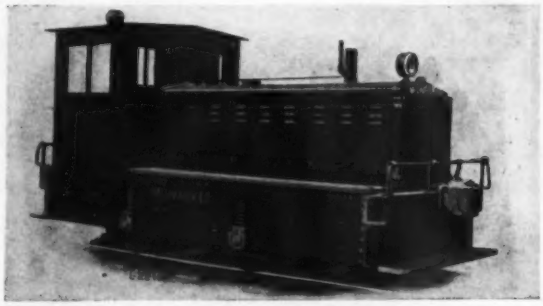
5

UMI

DEVICES YOU OUGHT TO KNOW ABOUT

A New Milwaukee Gasoline Locomotive

The Milwaukee Locomotive Manufacturing Co., Milwaukee, Wisconsin, have added to their line of type "H" locomotives two new sizes, the 18 and 20-ton machines. These latest 18 and 20-ton sizes are of the four-speed, gear-and-chain-drive type, and are geared for four speeds of 2, 4, 6 and 12 miles per hour, both forward and reverse. The new machines are built for all gauges of track from 30 to 56½ inches. They are equipped with the "Beaver" six-cylinder engine. Further information may be had upon application to the manufacturer.



The New Type "H"-18, 18-Ton Milwaukee Gasoline Locomotive

A New 60-Ton Oil-Electric Locomotive

A 60-ton Oil-Electric Locomotive was recently purchased by the Central Railroad of New Jersey and placed in service in their Bronx Terminal, New York City.

The Oil-Electric Locomotive with its internal combustion engine and electric generator, is the product of the *American Locomotive, the General Electric and the Ingersoll-Rand Companies.*

The oil engine, which is the product of the Ingersoll-Rand Co., has six cylinders, and is of the four-cycle, single-acting, vertical type. Directly connected with the oil engine is a General Electric generator, with a voltage ranging from 200 to 750. The output is regulated by throttle to the demands made upon the dynamo by the tractive motors.

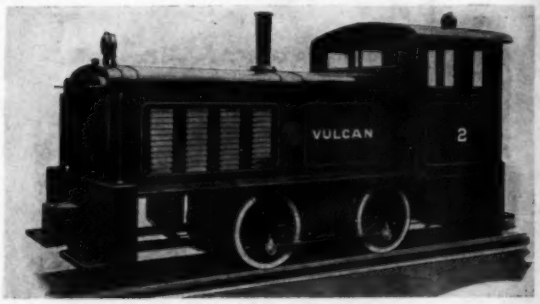
It is said that the control of the locomotive is extremely simple. The engineer has only to manipulate two control handles: one that serves as a throttle lever to control the output of the engine; while the other is a master control or electric switch which puts the tractive motors either in series or in parallel as circumstances may require.

This locomotive has a tractive effort of 23,000 pounds, develops 300 h.p., and has a maximum speed of 45 miles per hour.

The Oil-Electric Locomotive

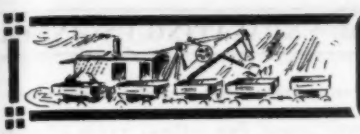
A New Vulcan Gasoline Locomotive

The Vulcan Iron Works, Wilkes-Barre, Pennsylvania, has recently placed on the market a new 12-ton worm-gear-driven gasoline locomotive, known as the Class EW-12. This locomotive is equipped with a 100 horsepower Waukesha motor with Ricardo head and is built in all the prevailing track gauges. Further information may be obtained upon writing the manufacturer.



A New Cleveland Tractor

The Cleveland Tractor Company, Cleveland, Ohio, have recently added to their line of tractors a new model to be known as the Model "K" Cletrac. This new tractor though not of the heavy type offers the advantages of a crawler construction. New features have made it an all-around heavy-duty tractor offered for construction and industrial service. Further information may be obtained by writing the manufacturer.



SHOTS FROM THE FIRING LINE

New York State News

BY J. P. BURNS

One of the best known contractors including sand and gravel is the Ward Bros. firm of Suffern, New York. For the past two to five years Wards had actually more excavation and road jobs than the average contractor could handle. At the present time they have under construction twenty-one miles of new road building in Miami, Florida.

John F. Gell Company of Rochester are about finished on their last contract in Dutche County.

The Oliver Costic Company, Rochester, have enough contracts to keep them busy until late next spring.

The Genesee Stone Corporation of Batona, with quarry at Stafford, have closed their plant for the winter months, after one of the most successful years in the history of the company. Their equipment includes three large steam shovels which they are placing caterpillars under during their slack season.

The writer was with Mr. A. R. Bixby of Buffalo, New York, in Rochester this month. Mr. Bixby is well known throughout New York and Ohio states, and spent several years in Pennsylvania in anthracite coal regions.

The output of sand and gravel at the F. J. Boland plant, Johnson City, is about 25 per cent over any other year in the history of the company.

Mr. W. H. Fitzgerald expects to finish his present contract about February 1st; due to weather conditions this job has been held up several weeks. Mr. Fitzgerald is using a Bucyrus 20-B dragline in dragging river and building road through river bottom between Johnson City and Endicot, New York.

The firm of Frost & Lowman of Watkins have three shovels to take care of their increasing business. Mr. Lowman who looks after equipment and new jobs is well known for his knowledge in handling large contracts.

L. Grossman & Co. of Poughkeepsie will not finish their present contract until next spring. They also have new contracts to take care of.

Pacific Coast Notes

BY P. H. BIRCKHEAD

Contract awarded to Utah Construction Co., Ogden, Utah, and Phelan Building, San Francisco, by the Union Pacific Co., Omaha, Nebraska, for the construction of 25 miles of railroad from Echo to Gateway, Utah.

Contract awarded by the Northern Pacific Railroad, St. Paul, Minnesota, to Twohy Bros., 2001 Halsey Street, Portland, Oregon, and Sharon Building, San Francisco, for the construction of 40 miles of railroad in Idaho starting at Arofino, work involving approximately 1,000,000 cubic yards excavation, 70 per cent rock.

Bids received from following by West Side Irrigation District, Tracy, California, for drainage of canals, involving 52,000 cubic yards excavation, John Phillips, Oakland, California, and E. T. Fisher, Colusa, California.

Southern States Notes

BY W. W. WHORLEY AND C. N. BALLENTINE

D. C. Hanrahan is operating a Bucyrus 50-B steam shovel for the Marion County Lime Company at Early Bird, Florida.

We are glad to report that shovel engineer John Roberts, who recently was operated on for appendicitis, is up and around again.

George Ridge is fighting rock with a Bucyrus 20-B shovel for the Tennessee State Highway Department near Monteagle, Tennessee. Mr. E. P. Russell is superintendent in charge.

Al Oldacre of Jasper, Alabama, is a busy man since he has been made superintendent in charge of both the Manchester and Saragossa mines of the Southern Coal Company.

Andy West is loading shale with a Bucyrus 20-B for the Herty Shale Products Company at Daisy, Tennessee.

T. H. Winston is superintendent of Mine No. 14 of the De Bardeleben Coal Corporation at Corona, Alabama.

George Mefford is digging ditches with a Bucyrus 50-B Diesel dragline for the McWilliams Dredging Company near Osceola, Arkansas. Elmer Kranz is foreman on this work.

A large number of drainage contractors gathered at Osceola, Arkansas, last month for one of the largest lettings ever held in Mississippi County, approximately 15,000,000 yards being awarded. Contracts 1 and 3 were awarded jointly to Broderick Bros., F. J. Clarke and Roy L. Igo. The Iowa and Nebraska contractors were well represented. Contract No. 2 was awarded to Briggs & Drew, Omaha, Nebraska. Contracts 5 and 8 inclusive, involving cleanout work and small ditches, were awarded to Crumpecker & Adams of Moorehouse, Missouri. Oscar Kocktitzky was successful bidder on about two million yards.

Robert M. Rogers is operating a Bucyrus 20-B dragline for the State Road Department in Florida. He writes that the machine has handled over 250,000 yards with very little repair expense. His address is Camp No. 26, Port Saint Joe, Florida.

St. Louis Items

BY A. B. KOENIG

J. T. Carr of Monticello, Arkansas, submitted lowest bid for construction of 21 miles of gravel work on the east and west highway in Desha County, Arkansas. His bid was $109,073.01. Contract will be awarded as soon as Federal approval is given.

Jones-Wilson Construction Co. were awarded contract for widening banks and ditching on Kansas, Oklahoma & Gulf Railroad in Oklahoma. They are going to do this with stationmen. Columbus S. Jones, an old station contractor, is the senior member of this firm.

The J. W. McMurry Contracting Co. were awarded contract for renewing bridges and culverts on the Kansas, Oklahoma and Gulf Railroad.

Gierke & Clelland report their grading outfit, consisting of tractor, grader, wheelers and fresnos, idle at Dana, Illinois. They want any kind of grading.

The Frisco Railroad will spend $2,500,000 to rehabilitate the Muscle Shoals, Birmingham & Pensacola Railroad, recently purchased in order to develop a trunk line for heavy traffic to the port of Pensacola. The Pensacola line is 142 miles long and runs from Kimbrough, Alabama, to Pensacola, Florida.

W. P. McGeorge & Company were awarded contract in Louisiana by the Missouri Pacific Railroad. This firm sublet their Missouri Pacific Railroad work near Columbia, Illinois, to John Kenney.

P. T. Clifford & Son have several team and shovel outfits at work double tracking the Pennsylvania Railroad just east of East St. Louis. John Connell is superintendent in charge of this work.

The construction of a new freight and passenger station by the Missouri Pacific Railroad Company is planned in the near future at Corning, Arkansas. The proposed building will cost approximately $30,000.

John Kenney shipped his team outfit from Astoria, Illinois, to Columbia, Illinois, building a spur for the Missouri Pacific Railroad.

The expenditure of $130,000 for enlarging and modernizing the shops of the St. Louis Southwestern Railroad at Pine Bluff, Arkansas, has been approved by the railroad. The erection of new buildings and the installation of modern machinery is included in the program.

Gulfport, Mississippi, awarded the following contracts: Asphalt paving to Baird Eller Company of Nashville, Tennessee, their bid $229,500; brick paving to the Merrill Engineering Co., Jackson, Mississippi, $101,750; sidewalks, curbs and gutter, M. Perry, Mobile, Alabama; storm sewers to Hamilton Bros., Gulfport, Mississippi.

Hoover Brothers were awarded contract for 8300 feet of curbing on Robert Gilham Road between 39th and 45th Street, Kansas City, Missouri; the curbing contract is the first step in widening the roadway of the Boulevard.

E. B. Styles wires from Simpson, Illinois: "Have 30 days' work for 25 teams, hauling sand and gravel. Four dollars per ton, five-mile haul. Roads fair."

Plans of the State Highway Commission for constructing a large bridge over Black River, 16 miles southeast of Poplar Bluff, Missouri, have been approved by the War Department. The bridge will be more than a quarter mile long and will cost approximately $125,000.

Clarence Mitchell of the Flick Construction Co., 133 West Washington Street, Chicago, Illinois, was in this neighborhood endeavoring to locate a steam shovel job. They have a couple of shovel outfits idle.

Charley Marshall shipped his shovel outfit from Kansas to West Liberty, Ohio, to a job he subbed from the Walsh Construction Co. Charley says he has enough work to hold him a year.

Albert Hood reports good progress with his state highway work near Leavenworth, Kansas.

The Carmichael-Cryder Co. are putting the finishing touches on their Wabash job at North Kansas City.

W. Burton is stripping a quarry for Atwood & Son at South Liberty, Missouri.

W. G. Ransom says everything is going along nicely.

Shugart & Blythe report two million yards of team work on the Welland Canal in Canada. They will move on to this work in spring.

E. E. Hudson is filling bridges and ditching for the Frisco Railroad in Southern Missouri.

Allhands & Davis have in the neighborhood of 100 stationmen at work on bank widening on the Cotton Belt Railroad in Arkansas. E. S. Price and Fred Carlson are taking care of this job.

H. H. Carrothers, Inc., Kansas City, was awarded contract for the construction of a $300,000 Memorial Stadium at the University of Missouri, Columbia, Missouri. The stadium, to be built around the side of a hill with the gridiron field in the center, will form a natural amphitheater with a seating capacity ultimately of 90,000. The first unit to be completed this year will seat approximately 25,000.

Contractors when in want of labor or work for their outfits get in touch with the Koenig Labor Agencies, 612 Walnut Street, St. Louis, Missouri, or 501 Delaware Street, Kansas City, Missouri.

Twin City District

BY J. CARL YETTER

Hatten & Hatten of Storm Lake, Iowa, were low bidders on some drainage work at Worthington, Minnesota, on November 23rd.

The James O. Heyworth Company, who have the contract for building the new bridge over the Mississippi River near the Ford Plant in the Twin Cities, are making rapid progress. Present indications are that they will finish ahead of schedule.

T. J. Frederick Company have completed their contract at Carlton, Minnesota.

Barnard Curtis Company, Minneapolis, have recently placed a new Bucyrus 50-B Diesel shovel on their drainage work near Bowling Green, Ohio.

Strom Construction Company report suitable progress on their drainage work in Florida.

The Motor Haulage Company of Minneapolis have their universal truck crane loading trucks on a gravel job in Hennepin County.

C. M. Babcock, Minnesota Highway Commissioner, has recently returned from an extended tour of South America as a member of the highway commission appointed by President Coolidge.

Canada

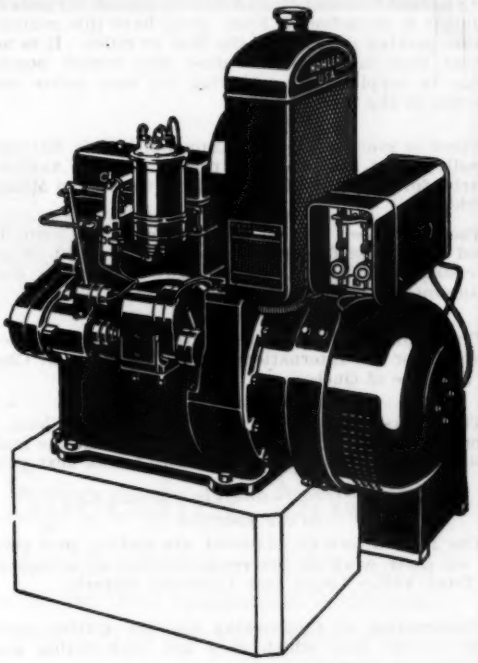
Montreal and Vicinity

BY J. M. WARD

The Northern Construction Company have closed down their big job at Quebec for the winter months. There are only a few men kept around doing some minor work.

We had a visit this week from Mr. Fred Peckham of Gorman & Peckham who have subcontract from the Aluminum Co. of Canada for a railway. They expect to be through this month unless some additional work is gone ahead with.

"We Are Entirely Satisfied with the Performance of These Lighting Plants"—



Kohler Automatic Model D
1500-watt; 110-volt, D. C.

so writes W. H. McDonough, secretary and treasurer of the McWilliams Dredging Company, Chicago, Ill., of the five Kohler Electric Plants installed on the company's dredging equipment.

The experience of the McWilliams Dredging Company with the Kohler Automatic Electric Plant is matched by that of thousands of users in *contracting* and other service. These owners are enjoying a radically better kind of electricity — standard 110-volt current for lighting and all power purposes, freedom from the usual care and expense of storage batteries, and press-the-button operation, completely automatic.

You should know about the Kohler Automatic. Write for demonstration and booklet "The Principle and the Proof."

KOHLER OF KOHLER

KOHLER CO., *Founded 1873*, KOHLER, Wis.
Shipping Point, Sheboygan, Wis.

The name of the Rouyn Railway has been changed to the Canadian National Branch Lines Limited. Chambers, McQuigge & McCaffrey & Foley Bros. have this contract and are making progress on the first 10 miles. It is not thought that much will be done this winter beyond getting in supplies and preparing for very active construction in the spring.

There is some talk of the Canadian Pacific Railroad extending their line, which at present ends at Angliers, Ontario, further on, reaching towards the Rouyn Mining District.

There has been nothing done in connection with the Grand Falls, New Brunswick, power development. Since the change of elections, the new government has been looking into this contract and criticising it.

Fraser-Brace, Limited, are actively engaged in a new pulp mill for the International Paper Company at Chelsea, Province of Quebec.

There has been considerable activity at Chute a Caron on the Aluminum Company's works, but the main construction will not be proceeded with before next year.

Toronto and Vicinity

BY C. F. ENGLAND

The T. A. Brown Co., Limited, are making good progress on their work in the reconstruction of a lock on the Trent Valley Canal near Lakefield, Ontario.

Construction & Engineering Co. are getting along nicely on the dam which they are constructing near Peterborough, Ontario.

McDougall Bros. of Ottawa have finished up the work on which they were working their Bucyrus 70-C on Section 7, New Welland Ship Canal.

Johnson Bros. Co., Limited, have been awarded contract for subway for the Ontario Department of Public Highways at Cooksville, Ontario.

Northern Construction Co. and Stewart & Welch are showing great activity on their excavation work on Section 8, New Welland Ship Canal.

Vancouver and Vicinity

BY J. C. MOON

Messrs. Stewart & Barber, who have the contract for extension of the Marine Drive to Horseshoe Bay, have also secured the contract for the new scenic highway up Grouse Mountain at North Vancouver. The cost of this road is estimated at $135,000, and will have a length of about 7½ miles with an average grade of about 6 per cent, the maximum being 8 per cent. Specifications provide for completion by August 15th, next.

Considerable opposition has developed to the Provincial Government's proposal to extend the Provincial Government Electric Railway to Fort George and to connect up Squamish to North Vancouver, and it is now understood that these extensions will be dropped for the present whilst an effort is made to interest outside capital in the purchase of the system, and with this in view authority is likely to be obtained to offer liberal grants of land to those who might be interested in such a proposition.

QUALITY

The success this tooth has enjoyed and the constant replacement of other styles by it furnishes the greatest proof of its worth.

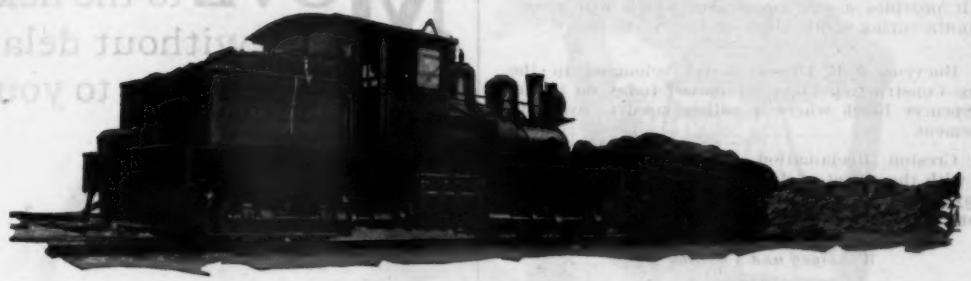
SERVICE

Most builders of steam shovels can meet your requirements by shipments from stock. If they cannot we can.

Write for Exchange Proposition

TAYLOR-WHARTON IRON & STEEL COMPANY

High Bridge, New Jersey



Move More Rock With Speedier Shays

NO matter how efficient your shovels, crushers or other units may be, their production is dependent upon the locomotives you use to move the stone.

If your locomotives are slow in spotting, slow in accelerating, and inefficient on grades, stone movement is handicapped, machines and men idle, and production and profits suffer.

The Shay Catalog will tell you what Shays are doing under conditions similar to yours. Write for a copy.

Faster-working Shay Geared Locomotives conserve time and minimize these losses.

In accelerating to running speeds, Shays are 22 percent faster. At spotting, Shays are 11 percent quicker. On grades, too, Shays are speedier.

Actual experience can prove that Shays will improve your production and add to profits. May we explain the reasons why?

LIMA LOCOMOTIVE WORKS

Incorporated

Lima, Ohio 17 East 42nd St., New York

LIMA *Shay Geared* LOCOMOTIVES

For convenience in making inquiry use postal inserted in this number

The Second Narrows Bridge connecting North Vancouver with Vancouver was officially opened on November 7th, and has already proved a most valuable link between the two cities. In addition to provision for motor traffic, it provides a rail connection which will stimulate manufacturing of all kinds on the North Shore.

The Bucyrus 20-B Diesel shovel belonging to the Northern Construction Company moved today on to the David Spencer Block where it will be used to excavate the basement.

The Creston Reclamation Co., Limited, has been formed with the object of dyking 10,000 acres of land on Kootenay Flats, British Columbia, and it is expected that work will be commenced in the near future.

Winnipeg and Vicinity

BY F. X. AMOSS

The Carter-Halls-Aldinger Company have about completed the excavation for the new Hudson's Bay Departmental store on Portage Avenue, Winnipeg. Two Bucyrus machines, an 18-B and a 35-B, have been used on this work. About half of the 149 caissons have been poured.

Messrs. Macaw & Macdonald, general contractors, Winnipeg, have secured the contract for a new building at Fort Osborne Barracks, the extension to the pier and breakwater at Victoria Beach, and for the new center pier for the highway bridge at Keewatin, Ontario.

The Carter-Halls-Aldinger Company report excellent progress on the foundation work for the new pulp mill at Fort Alexander, Manitoba. Mr. W. S. Tomlinson is doing some of the excavation work with his dragline.

Dr. S. C. Ells of the Department of Mines, Ottawa, who has been engaged in research work in the Athabasca country for several years, in an address before the Calgary Board of Trade urged that the development of bituminous tar sands in Alberta should be proceeded with. As a supplementary source of petroleum and for road material it had been demonstrated from experiments made in Edmonton that the tar was of the highest quality for this work, and we believe that Alberta stands on the threshold of a great and new industry.

Official announcement has been made that the Flin Flon Copper Mine at The Pas, Manitoba, has been sold to United States mining interests, generally rumored to be the Guggenheim. A new refinery and new buildings and railroad are expected to be begun immediately.

NOTICE!

Index for The Excavating Engineer
Vol. XIX—1925

May be obtained on application to

THE EXCAVATING ENGINEER
SOUTH MILWAUKEE, WISCONSIN

USE THE POSTAL INSERT ENCLOSED WITH THIS ISSUE

MOVE to the next job without delay —without injury to your machines—

Use a Rubber-Tired

TRAILER TRUCK

(Built to carry Steam Shovels)

4 SIZES—25 to 50 Tons

The New, 6-Wheel, 30-Ton Trailer can be loaded from the rear or from either side—it will turn in its own length—and—a 5-ton truck will haul it.

BUCYRUS COMPANY
SPECIALTY DEPARTMENT
SOUTH MILWAUKEE, WIS., U. S. A.

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The Key to the Situation is [HERE]

Western Dump Cars are built in all practical sizes, from 1½ to 50 yards, narrow and standard gauge. We will appreciate an opportunity to explain to you the many fine points of engineering that make Westerns more valuable to you than any other car.

Western

Time *always* counts when a powerful shovel is gouging its way through a job.

There is no time on *any* job to wait for Dump Cars that are slow, inefficient, or — out of order.

Western Dump Cars see the job through in minimum time because of their quick, positive action and rugged strength.

Nearly fifty years of experience in the making of earth-moving equipment is built into Western Dump Cars. They are time-tested and service-tested by practical men on thousands of tough jobs.

That's why when you buy Western Dump Cars you buy definite results. You can make more money with Westerns!

Western Wheeled Scraper Company

Earth and Stone Handling Equipment Since 1877

Aurora, Illinois

For convenience in making inquiry use postal inserted in this number.

TRADE NOTES

Wm. M. Zintl, of the Advertising Sales Department of the Curtis Publishing Company, has been appointed Director of Sales of the Paint and Varnish Division of the Paint, Lacquer and Chemicals Department, of *E. I. du Pont de Nemours & Company.*

Jean Boyan has been appointed as resident engineer of the *Compagnie Francaise Thompson-Houston* with offices in the International General Electric Company at Schenectady, succeeding Jean Canivet, who was accidentally drowned July 10, 1925.

The Climax Engineering Company, Clinton, Iowa, have just issued the following bulletins: Bulletin "A" describes the "K" series, four-cylinder, 5-inch x 6½-inch engine; Bulletin "B" covers the "T" series, four-cylinder, 5½-inch x 7-inch engine; Bulletin "C" describes the "R" series engine, which is made in two models, Model "R4U" covering the four-cylinder 6-inch x 7-inch engine and Model "R6U" covering the six-cylinder 6-inch x 7-inch engine. Copies of these bulletins may be secured on application to the manufacturer.

The Milwaukee Locomotive Manufacturing Company, Milwaukee, Wis., will have on display at the Good Roads Show, Chicago, space "W-1," a Milwaukee Type H-7, 7-ton, four-speed gasoline locomotive. Mr. Geo. H. Fanning, Sales Manager, with other members of the sales force, will be in charge of the exhibit.

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us.

CONSTRUCTION OF PARALLEL WIRE CABLES FOR SUSPENSION BRIDGES — 9 x 12, 104 pages. This book gives dimensions and brief summaries of the work on 15 suspension bridges from the Pittsburgh Aqueduct in 1844 to the Bear Mountain Hudson River Bridge which was open to the public in 1924. The book tells the story of this last suspension bridge in great detail. In addition to a story of the preliminary tests and the actual work, charts and diagrams are given which the engineer will unquestionably find of great interest. In addition

THERE is an interesting story connected with the design and working parts of Madison-Kipp Lubricators. We believe any operator or engine mechanic would find this story instructive as well as interesting.

We have prepared a bulletin which describes the inside mechanism of Madison-Kipp Lubricators which we will send to anyone requesting it.

May we mail one to you? Ask for Bulletin No. 50.

Madison-Kipp Corporation

Madison, Wisconsin, U.S.A.

Instantly — **and by power — the Buckeye conveyor is shifted from one side to the other.**

High enough to load direct into wagons or trucks. No time lost in the shift — the dirt is *kept moving.*

And the dirt comes up *steadily.* The extra wide belt, kept centered by a patented construction, is driven from both ends.

The wettest, slipperiest material is handled successfully — speedily — positively.

In crowded quarters the Buckeye Quick-Shift Conveyor enables you to keep going when trees or poles are close to the trench.

But don't judge Buckeyes by only one feature. There are many others equally profitable for you to have.

Ask us to explain them. Or, better yet, *ask any user.*

The Buckeye Traction Ditcher Company
Findlay, Ohio

Manufacturers of Trench Excavators (both Wheel and Chain-and-Bucket Types), Pipe Line Trench Excavators, Tile and Open Ditchers, Back-Fillers, Pipe Screwing Machines, Curb Diggers and Clay Diggers.

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BUILDERS OF TRENCH EXCAVATORS FOR 30 YEARS

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The Motor
Behind The Shovel

Endurance
in the great mechanical strength of the massive steel castings.

Long Life
by means of mica and asbestos insulation which renders the coils immune to the destructive effects of continuous overloads.

High Efficiency
in the advanced engineering design—both mechanically and electrically.

WESTINGHOUSE-EQUIPPED electric shovels are the standard in modern excavating practice, especially in those hard-to-get-at locations where fuel haulage is a serious problem and suitable boiler water is unavailable.

Westinghouse motor-driven shovels are economical, too. They require no firemen or hostlers and are not subject to boiler problems and the standby losses common to steam drive.

The Westinghouse type MC direct-current motor is made to withstand the violent stops, starts and reverses of the most severe shovel operation.

Endurance is built-in, from the massive steel castings to the solidly-fused, indestructible rotor.

You get all these advantages by specifying Westinghouse-equipped shovels, either direct current or alternating current.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

Westinghouse

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to these charts 69 large-sized plates are included which give a very complete pictorial story of the construction of bridge cables. The book is published by *John A. Roebling Sons Company*, manufacturers of wire rope at *Trenton, New Jersey*.

THE SNOW REMOVAL BOOK—6 x 9, 52 pages and cover, illustrated, describes various types of snow plows and caterpillar tractors removing snow from highways. A copy of the book may be had upon application to the *Caterpillar Tractor Co., San Leandro, California*.

INSTRUMENT TRANSFORMERS—8 x 10½, 52 pages and cover, illustrating and describing instrument transformers and other recent electrical developments of the *General Electric Company at Schenectady, New York*. A copy of this Bulletin G. E. A.-178 may be obtained by writing the manufacturer.

COMPARISON OF DIESEL ENGINE PRINCIPLES—8½ x 11, 24 pages and cover, illustrated, describes the various types of Fairbanks-Morse Diesel engines and their working principles. A copy of the Bulletin No. 1020 may be had upon application to the *Fairbanks-Morse & Company, Chicago, Illinois*.

THE ENGINEERING ACHIEVEMENTS OF THE WESTINHOUSE ELECTRIC AND MANUFACTURING COMPANY FOR THE YEAR 1925—8 x 10½, 41 pages, illustrated, describing the electrical achievements of the *Westinghouse Electric and Manufacturing Company* during the year of 1925. A copy may be obtained upon application to the manufacturer at *East Pittsburgh, Pa.*

Avoid *Freezing*

There are no pockets in the Improved Automatic Drain Valve.

It will keep your engines free from water at all times.

Investigate this.

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SPECIALTY DEPARTMENT
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A STEADY, constant air pressure is required on your pneumatic tools if you are going to get the most profit out of your road job. And that is just what the "SCHRAMM" Multi-Cylinder Compressor furnishes. Driven by the big, powerful, 4-cylinder Buda motor, the "SCHRAMM" Compressor furnishes a surplus of air at all times. It is never necessary for the tool operator to wait for pressure to build up.

On the "SCHRAMM" it is not necessary to start the engine against full load. The clutch takes care of that. You start the engine easily on the first turn and then throw on the compressor load.

The 120 cubic foot compressor with a piston displacement of 25 per cent more and 100 per cent more power than on ordinary compressors of this type, costs you no more than others without these features.

Conveniently located stocks throughout the country make it possible to offer you a free demonstration on your job, to prove that the "SCHRAMM" Compressors offer you more air per dollar of investment and upkeep than any other compressor on the market. Write for full details or see them at the Road Show in Booth S-7.

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In the Valley City Drainage District, opposite Naples, Illinois, two Fairbanks-Morse Diesel Engines drive large capacity Fairbanks-Morse Centrifugal Pumps, draining 5000 acres of river lowlands. In over two years of operation there have been no repairs or interruptions in service—again proving the great dependability of Fairbanks-Morse equipment *engineered to the job.*

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THE ALBATROSS — 8½ x 11½, 32 pages, illustrates and describes the late designs and types of White trucks and busses, their duties and performance. A copy may be obtained by writing to *The White Company, Cleveland*, Ohio.

CATERPILLAR 5-TON TRACTOR — 6 x 9, 16 pages, illustrated, describing the 5-ton caterpillar tractor, a product of the *Caterpillar Tractor Company, San Leandro, California*. A copy of this bulletin may be obtained upon application to the manufacturer.

AUTOMATIC VOLTAGE REGULATORS — 8 x 10½, 60 pages and cover, illustrating and describing automatic volt regulators and their uses. A copy of this Bulletin G. E. A.-123 may be obtained from the *General Electric Company, Schenectady, New York*.

BLASTING ACCESSORIES — 80 pages, comprehensively illustrated, gives complete and detailed data on the various accessories needed for firing charges of explosives, together with explanations of the best methods of using these accessories. Users of explosives may obtain copies upon application to the *Advertising Department of the E. I. du Pont de Nemours Company, Wilmington, Delaware*.

In 1881 the Edison lamp works made 35,000 lamps. Now the output of electric lamps to light the world is 3,000 a minute.

And what is still more impressive is that the value of the Tungsten filament lamp measured by length of life and lighting power is 325,000 times that of the carbon filament lamp of 1881.

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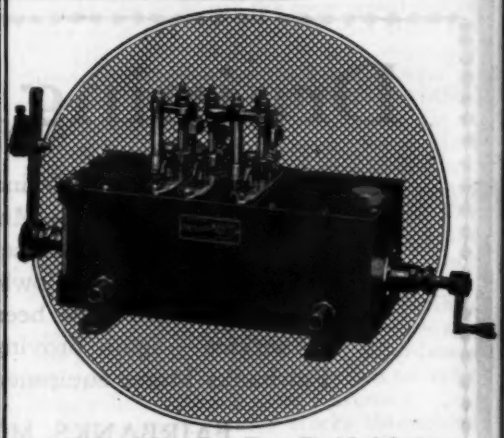
A McCord Force Feed Lubricator Will Keep Your Shovel on the Job

A McCord force feed lubricator installed on your steam shovel now will insure more continuous operation. Dependable force feed lubrication prevents shutdowns and delays, it gives more hours on the job.

McCord force feed lubricators are used as standard equipment by the largest and best-known steam shovel builders and they will be installed on any shovel at your request.

Put a McCord lubricator on now and be assured of dependable lubrication for the life of your shovel.



McCord Class B. A. Force Feed Lubricator

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Detroit, Michigan

McCord
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This SARGENT DITCHER is powered by a TWIN CITY ENGINE.

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Here is a machine that will eliminate the use of track jacks and bars, cut track crew to less than half, and do four times the work.

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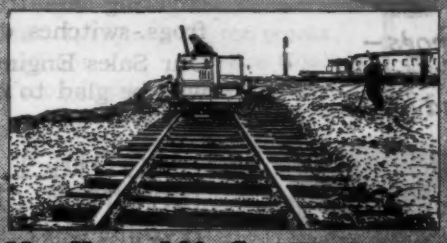

Nordberg Mfg. Co. MILWAUKEE WIS. U.S.A.

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Cement Output Reaches Record

More Portland cement was produced in the United States during 1924 than at any similar period in history. There is every probability that the output reaches 150,000,000 barrels.

This is within 12,000,000 barrels of the annual capacity of the existing plants, and about an equal amount, or 12,000,000 barrels, above the record production of 1923.

34 per cent of this production is used in building construction, and about 24 per cent in paving and road construction.

During the first nine months of 1924, 7,500 miles of concrete pavement, averaging 18 feet wide, were placed under contract. Of this amount about 4800 miles was for highways, and 2500 miles in cities and towns.

In other words enough concrete city pavements were laid in 1924 to pave a road 30 feet wide from New York to Chicago and thence to Minneapolis, and this in itself is a larger amount than was contracted for during the whole year of 1923 which was the best 12-month period previous to 1924.

As a result of all this activity there are now 13 new concrete plants under construction throughout the country, of which about one-half will be completed by January 1st.

This will bring capacity production for the country up to 170,000,000 barrels per year.

In addition to those under construction, there are also 16 other plants under consideration. If these materialize, production capacity by 1925 should reach approximately 185,000,000 barrels.

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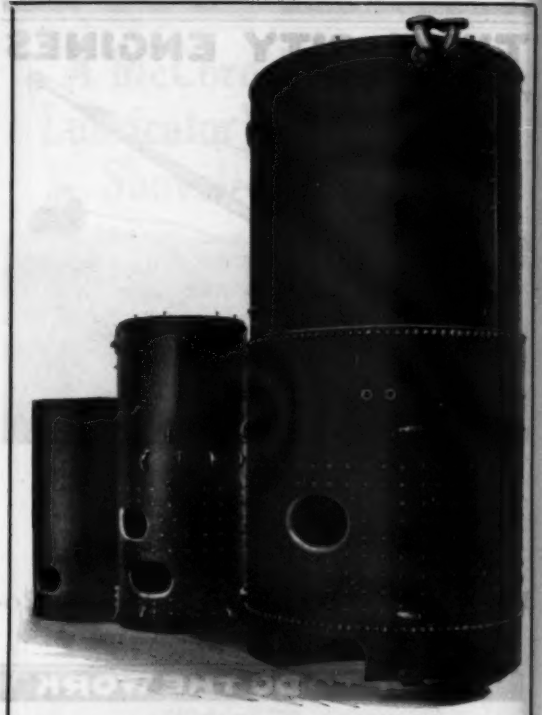

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BRUTE in name, power, in size. Brute in terrific stamina and tremendous endurance. Big Brute is built to stand impregnable against the most brutal requirements of man and industry.

Beautiful in its brutal ugliness, Big Brute looks what it is . . . . a *Colossus among the Giants of modern transportation.* With the operating ease of a lithe passenger vehicle: a Fisher-Built Cab to furnish driver's comfort unknown before, and mechanical improvements years beyond the ordinary conception of today, it stands to change the industrial motor transportation of the world.

A Truck Without "Bugs"

From its vast engineering experience, covering the production of over 4,849,485 passenger and commercial cars, during the last 25 years, General Motors Corporation has eliminated, in Big Brute, the vital weaknesses, the engineering mistakes, the structural flaws previously common among heavy duty trucks. **Big Brute is a truck without "bugs."** More than 71% of all motor vehicles made and sold by General Motors are now in active service.

The motor trucks of the entire world were studied by General Motors engineers in developing Big Brute. It was learned why some trucks rendered but limited service. Why others surpassed them. Why some operated under nominal upkeep, while others were economic failures. One by one, these factors were met, analyzed and weighed. All mistakes of past years were corrected. *A new standard in heavy transportation thus was set.*

Sold Under GMAC Plan

Big Brute, like all other products of the General Motors Corporation, is offered under the liberal General Motors Acceptance Corporation Plan of deferred payments—the lowest cost under which any motor car or truck can be financed on time payments.

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Yellow Light Delivery Trucks
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GMC 5 to 15 ton Tractors

GMC Big Brute

The Two 2½-Yard Full-Revolving Shovels Making a Cut 210 Feet Wide at the Pit of the Reliance Rock Company at Arusa, California

The two shovels digging their way down to pit level, dumping into a 50-ton skip car. The dragline on the top of the bank was used to open the pit. This machine, a Bucyrus Class-24, was built in 1910, and had had quite a varied career before starting this work.